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Commentary

Trends in informatics publications and health policy

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Healthcare delivery in the US changed with the adoption of the electronic medical record (EMR). The Affordable Care Act (ACA) and the Health Information Technology for Economic and Clinical Health (HITECH) Act of the American Recovery and Reinvestment Act (ARRA) were signed into legislation in 2009 and 2010, with the latter designed to encourage EMR use [1]. With these changes in healthcare delivery have come new opportunities which should continue to grow for clinical epidemiology research, combined with medical informatics, the science of collecting, classifying, storing and analyzing data using computers. While less than half of US ambulatory physicians reported use of an EMR in 2009, with these new federal initiatives and advancing technologies, the percentage of physicians in 2012 reporting use of an EMR increased to 72% as reported in the National Ambulatory Medical Care Survey [2].

With the adoption and evolution of EMRs forecasted to continue increasing, it is unclear if the research workforce will be able to keep pace to capitalize on this scientific potential. The funding of EMR implementation ($27 Billion) was 200 fold higher than the investment in informatics and its workforce development ($118 Million) [3]. We sought to quantify the trends in published informatics literature as a measure of clinical research informatics productivity from 2001 to 2012.

The electronic database of PubMed was searched using the Medical Subject Heading (MESH) of "INFORMATICS" for publications added annually between January 1 to December 31 for years 2001 through 2012. Between 2001 and 2012, a total of 6137 publications were added to pubmed with the MESH "Informatics". Manuscript volume ranged from 165 manuscripts in 2001 to 797 in 2011; 664 manuscripts were published in 2012. The number of published manuscripts was steady between 2009 and 2012 (Fig. 1).

We found evidence to suggest that the EMR adoption changes cited above are outpacing published informatics related research with little change in volume of published literature over the last five years, though acknowledge that there may be other relevant publications not identified by our search. While a degree of lag in research productivity and publication behind technology adoption and related regulations is to be expected, the token direct federal grants attributed to informatics and its workforce development is inadequate for the rapidly expanding capacity. It is essential to invest in the informatics workforce capacity, including the development of investigators with skills in clinical research informatics, so that the rich information in our EMRs can be tapped to improve US population health. Federal support through the National Institutes of Health, Agency for Healthcare Research and Quality, and National Library of Medicine needs to be targeted for workforce and resource capacity development.

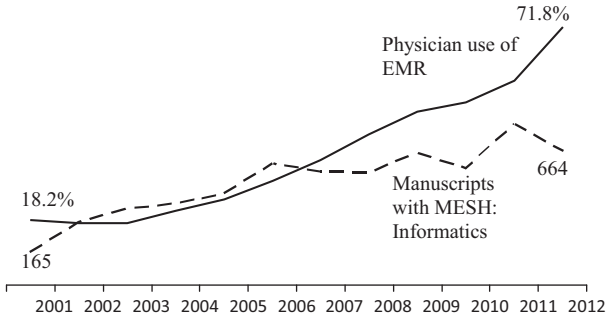

Fig. 1. Trends over time in published manuscripts with MESH "Informatics" and percentage of office-based physicians using electronic medical records (National Ambulatory Medical Care Survey), 2001–2012. MESH: medical subject heading. EMR: electronic medical record.

The design and implementation approaches historically utilized for population-based research will change with the availability of EMR information. Traditionally, a large percentage of clinical epidemiological studies and clinical trials have involved active recruitment and follow-up of participants with the use of surveys and medical records abstraction; this is no longer the case. The possibility of leveraging EMR information to help identify patients for recruitment and ensure diligent followup is attractive. In addition, EMRs record *how people actually get tested* and may provide a more effective, efficient and economical means to obtain answers from existing health information in the future. If we are to best utilize the EMR resources soon to be available for epidemiologic studies, it is important to encourage and develop investigators and methodologies related to clinical research informatics.

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